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Transgender-specific COVID-19-related stressors and their association with depressive symptoms among transgender adults: A nationwide cross-sectional survey in South Korea

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ABSTRACT

Introduction: COVID-19 has disproportionately impacted marginalized groups, including transgender populations, reproducing and exacerbating inequalities and vulnerabilities that existed in those groups prior to the pandemic. This study aimed to assess the prevalence of transgender-specific COVID-19-related stressors and their association with depressive symptoms among South Korean transgender adults.

Methods: We conducted a nationwide cross-sectional study of 564 South Korean transgender adults (trans women, trans men, and nonbinary people) from October 7 to October 31, 2020. We measured four transgender-specific COVID-19-related stressors as follows: (A) had difficulty receiving gender-affirming healthcare due to economic hardship related to COVID-19, (B) had difficulty receiving gender-affirming healthcare due to limited access to hospitals under the COVID-19 situation, (C) had difficulty purchasing a public face mask due to gender information on an identification card, and (D) avoided getting a COVID-19 test in fear of unfair treatment and dirty looks due to gender identity, despite having COVID-19 symptoms. Past-week depressive symptoms were assessed using the Center for Epidemiologic Studies-Depression Scale.

Results: Of the total participants, 30.7% experienced any of the four transgender-specific COVID-19-related stressors, and 70.2% were classified as having depressive symptoms during the past week. We found statistically significant associations with depressive symptoms among participants who reported that they had difficulty receiving gender-affirming healthcare due to either economic hardship (adjusted prevalence ratio [aPR] = 1.20, 95% Confidence Interval [CI] = 1.05–1.37) or limited access to hospitals (aPR = 1.15, 95% CI = 1.00–1.32), respectively. Furthermore, those who had two or more of the four transgender-specific COVID-19-related stressors were 1.21 times (95% CI = 1.05–1.40) more likely to report depressive symptoms, compared to those who did not report any stressor.

Conclusion: Transgender-specific COVID-19-related stressors may negatively influence depressive symptoms among South Korean transgender adults. Given these findings, transgender-inclusive interventions should be implemented at the policy level during the COVID-19 pandemic in South Korea.

KEYWORDS
COVID-19; depressive symptoms; gender minority; mental health; South Korea; transgender individuals; survey

Introduction

As of September 2, 2021, more than 218.4 million confirmed cases and more than 4.5 million deaths around the world have been reported due to the SARS-CoV-2 pandemic (commonly referred to as COVID-19) (Dong et al., 2020). In South Korea (hereafter Korea), where the current study is based, the first case was confirmed on January 20, 2020. The total confirmed cases in Korea were over 255,000, including over 2,300 deaths from COVID-19, as of September 2, 2021 (Ministry of Health & Welfare, 2021). As the

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COVID-19 pandemic continues to impact many communities around the world, public health researchers and advocates have voiced the need to investigate health outcomes of historically disadvantaged subgroups within populations, particularly those who experience unemployment, food insecurity, a lack of access to healthcare, and higher-risk for adverse health outcomes (Bambra et al., 2020).

COVID-19 has disproportionately impacted marginalized groups, including lesbian, gay, bisexual, and transgender (LGBT) populations, reproducing and exacerbating inequalities and vulnerabilities that existed in those groups prior to the pandemic (Cahill et al., 2020; Madrigal-Borloz, 2020; Phillips Ii et al., 2020; Whittington et al.,2020). In addition to preexisting health disparities particularly in mental health (Graham et al., 2011), LGBT people have socioeconomic vulnerabilities that can be exacerbated by COVID-19 (Cahill et al., 2020; Gato et al., 2021; Gonzales et al., 2020; Madrigal-Borloz, 2020; Phillips Ii et al., 2020; Suen et al., 2020; Whittington et al., 2020). Specifically, LGBT people are more likely than non-LGBT people to work in industries that are highly affected by the COVID-19 pandemic (e.g., restaurants and retail). Furthermore, due to physical distancing, LGBT people may not be connected to other LGBT community members, which could lower the protective effects of community support to external stressors (Gato et al., 2021; Suen et al., 2020). Moreover, due to widespread implementation of lockdowns and quarantine, there have been increased reports of conflicts among LGBT people living with family members who do not accept their sexual orientation and/or gender identity (Gonzales et al., 2020; Suen et al., 2020).

According to a recent review, there is a growing body of literature documenting unique health vulnerabilities and other challenges to accessing health services among transgender people, whose current gender identity and/or expression does not align with their birth-assigned sex (Reisner et al., 2016). Within the literature on transgender health, the above-mentioned socioeconomic vulnerabilities during the COVID-19 pandemic could negatively affect health outcomes of transgender people who already experience disparities in health (Herman & O'Neill, 2020; Poteat et al., 2020). For instance, transgender people who lose their job, have economic difficulties, or are socially isolated may be at elevated risk of depression, anxiety, and suicidality. In addition, transgender people may avoid visiting a doctor due to financial strain or fear of potential mistreatment and discrimination in healthcare settings, even when care is medically necessary during the COVID-19 pandemic (Herman & O'Neill, 2020; Poteat et al., 2020).

Furthermore, some transgender people face a myriad of interpersonal, social, and structural stressors specific to their gender identity that can impact adverse health outcomes (i.e., transgender-specific stressors). In particular, lack of gender-affirming healthcare (e.g., hormone therapy and/or surgery) and legal gender recognition could potentially be salient stressors for transgender people under the COVID-19 pandemic. First, transgender people may experience delays in or cancelations to gender-affirming healthcare due to economic difficulties or restricted access to hospitals during the COVID-19 pandemic (Herman & O'Neill, 2020; Jarrett et al., 2021; Jones et al., 2021; Kidd et al., 2021; Koehler et al., 2020; Restar et al., 2021; Roberts et al., 2020). Second, transgender people may be negatively affected by the lack of an identification document matching their gender identity, which could be a prerequisite for receiving public assistance and support services (e.g., food and medical supplies) under the COVID-19 pandemic (Perez-Brumer & Silva-Santisteban, 2020). From early March to July 2020, the Korean government enforced a 5-day rotation public regulation for purchasing public face masks to ensure a stable supply of masks due to a surge in their demand (J. Kang et al., 2020). According to this regulation, citizens were only allowed to purchase a limited amount of government-approved Korean filter (KF) masks each week at pharmacies. When Korean citizens purchased KF masks during the COVID-19 pandemic, they were required to present their identification document which includes gender marker (man or woman) (J. Kang et al., 2020). Third, transgender people may avoid getting tested for COVID-19 due to fear of discrimination or rejection related to their gender

identity (Koehler et al., 2020). These transgender-specific COVID-19-related stressors can potentially lead to adverse health outcomes, which could be explained by previous research on stressors that are experienced by transgender people due to their gender identity (Meyer, 2003; Testa et al., 2015).

To date, limited number of papers have been published globally on the mental health impact of transgender-specific COVID-19-related stressors among transgender people in particular (Jarrett et al., 2021; Jones et al., 2021; Kidd et al., 2021; Zwickl et al., 2021). In a study conducted in Australia (N = 985), transgender participants whose gender-affirming surgery was postponed or canceled were 1.56 times more likely to report thoughts of self-harm or suicide, compared to those whose surgery was not postponed or canceled (Zwickl et al., 2021). A global cross-sectional study of transgender individuals (N = 964), including those from Southeast Asian countries, also found that participants who reported decreased access to gender-affirming healthcare and resources (e.g., hormone medications and body modifiers) under the COVID-19 pandemic showed significantly higher prevalence of depression, anxiety, and suicidal ideation, respectively, than those who did not (Jarrett et al., 2021). However, no empirical research has been conducted in Korea to investigate the impact of such stressors on transgender individuals' mental health.

Before the COVID-19 pandemic, Korean transgender populations had already been facing substantial mental health disparities. Specifically, the prevalence of suicidal ideation among Korean transgender adults was more than five-fold higher than the general Korean population (Lee et al., 2020a). This disparity in suicidal ideation is alarming given that the suicide rate of Korea was ranked the highest among member countries of the Organization for Economic Cooperation and Development in 2017 (OECD, 2019). Furthermore, limited research has been conducted on exploring factors that could contribute to mental health disparities of transgender persons in Korea (Lee et al., 2020a; 2020b). To fill in the gaps and understand the impact of COVID-19 on Korean transgender communities' mental health and well-being, the current study aimed to identify transgender-specific COVID-19-related stressors and examine their impact on depressive symptoms among Korean transgender adults.

Methods

Data and study participants

We conducted a cross-sectional online survey of Korean transgender adults using SurveyMonkey. Data collection for this survey was from October 7, 2020 to October 31, 2020. The survey questionnaire was developed based on a review of a previous study conducted by the research team in 2017 ("Rainbow Connection Project II - Korean Transgender Adults' Health Study") and other relevant literature on transgender health. Several standardized measures, such as non-affirmation of gender identity scale (Testa et al., 2015), were translated from English to Korean and included in the survey. The contents of the questionnaire were reviewed and consulted by 6 transgender individuals (2 trans women, 2 trans men, and 2 nonbinary persons) and 4 transgender rights activists.

Participants were recruited through the following channels: (1) postings on a Facebook page of the research team and online transgender communities, (2) Seoul-based primary healthcare clinics that provide gender-affirming healthcare (e.g., hormone therapy), (3) LGBT rights organizations, (4) referrals from participants to acquaintance or friends, or (5) others than listed above. At these channels, participants were provided an explanation for the study purpose and procedure with a web link and a QR code for survey participation. All study materials were written and presented in Korean. The study procedures have been reported previously (Lee et al., 2021).

Individuals were eligible for this study if they (1) were Koreans living in Korea, (2) aged 19 years or older, and (3) were identified as transgender. Participants' transgender identity was assessed using a two-step method asking questions about their assigned sex at birth (male or female) and current gender identity (man, woman, and neither man nor woman) (Reisner et al., 2014). Based on the responses to these variables,

participants were categorized into four groups as follows: trans woman, trans man, nonbinary assigned female at birth (AFAB), and nonbinary assigned male at birth (AMAB). For example, nonbinary AFAB indicated a person whose sex assigned at birth is female and currently identifies as neither man nor woman. In this study, we separated nonbinary people by their assigned sex at birth (male or female) to minimize the assumption that nonbinary people are a monolith. In addition, for the current study, the term 'transgender' was used to indicate trans women, trans men, and nonbinary people.

Measures

To assess transgender-specific COVID-19-related stressors, we created the measures based on relevant literature that was recently published (Herman & O'Neill, 2020; Jarrett et al., 2021; Perez-Brumer & Silva-Santisteban, 2020). Participants were asked whether they have ever experienced the following transgender-specific COVID-19-related stressors: (A) had difficulty receiving gender-affirming healthcare due to economic hardship related to COVID-19, (B) had difficulty receiving gender-affirming healthcare due to limited access to hospitals under the COVID-19 situation, (C) had difficulty purchasing a public face mask due to gender information on an identification card, and (D) avoided getting a COVID-19 test in fear of unfair treatment and dirty looks due to gender identity, despite having COVID-19 symptoms. Based on the responses to each item, we created variables as follows: (1) each transgender-specific COVID-19-related stressor (never experienced, experienced a certain stressor, and experienced stressor(s) other than the certain stressor), (2) any transgender-specific COVID-19-related stressor (never experienced and experienced) and (3) the number of transgender-specific COVID-19-related stressors (none, one, and two or more).

Depressive symptoms during the past week were assessed using the Center for Epidemiologic Studies-Depression Scale (CES-D) (Radloff, 1977), which has been previously validated in a sample of the Korean population (Cho & Kim, 1993). Participants were asked to respond to 20 items of CES-D (e.g., "I had trouble keeping my mind on what I was doing"), using a 4-point Likert scale (0 = less than one day per week, 1 = one or two days, 2 = three or four days, 3 = five to seven days). The maximum possible score was 60, and participants who reported a score of 16 or more were classified as screening positive for depressive symptoms (Radloff, 1977).

Participants also reported self-identified sexual orientation, age, residential area, educational attainment, monthly individual income, and employment status. We additionally included the following variables in the analysis, which may potentially confound the association between transgender-specific COVID-19-related stressors and depressive symptoms: legal gender status and gender perception by others. Legal gender status was categorized as follows: never tried to change legal gender marker, changed legal gender marker, and tried to change legal gender marker but did not change it. Gender perception by others was assessed by one item ("I have difficulty being perceived as my gender") which is included in the non-affirmation of gender identity scale (Testa et al., 2015). Participants responded using a 5-point Likert scale from strongly disagree to strongly agree. Based on the response, the variable was coded as perceived as my gender identity (strongly disagree, disagree, and neither agree nor disagree) or not perceived as my gender identity (strongly agree and agree).

Statistical analyses

Descriptive analyses were conducted to quantify the prevalence of any transgender-specific COVID-19-related stressor and past-week depressive symptoms across covariates. All variables were categorical, and thus, the Chi-square test was used. Multivariable analyses were conducted to investigate the association between transgender-specific COVID-19-related stressors and depressive symptoms. In the adjusted model, all covariates listed above were included. Since depressive symptoms were prevalent (70.2%) in this study, we used a log-linked Poisson regression model with a robust sandwich variance estimator (Barros & Hirakata, 2003). In this study, prevalence ratios (PR) with 95% Confidence

Interval (CI) were reported. All statistical analyses were performed using Stata/MP version 16.0.

Ethics consideration

The Institutional Review Board of Korea University reviewed and approved this study (KUIRB-2020-0189-01). Before responding to the survey questionnaire, all enrolled participants provided electronic informed consent, which detailed that participants have the rights to confidentiality of their data, refusal to answer any questions, and the minimal risk and benefits this study entails. Participants were provided 10,000 Korean Won (approximately $8.6) compensation for their time and participation of the study, and no referrals to COVID-19 services were provided.

Results

Among a total of 995 transgender individuals who initiated the online survey procedures, we excluded those who did not provide informed consent for this study (N = 164), did not fulfill the aforementioned eligibility criteria (N = 141), or dropped out of the survey (N = 99). We additionally excluded participants who had missing values on transgender-specific COVID-19-related stressors, depressive symptoms, and covariates (N = 27). In the final analysis, 564 transgender adult participants were included.

Table 1 provides information on transgender-specific COVID-19-related stressors according to transgender identity groups. Among the 564 participants, 32.5% identified as trans women; 18.4% as trans men; 37.9% as nonbinary AFAB; 11.2% as nonbinary AMAB. Approximately 15% of the total sample reported that they had difficulty receiving gender-affirming healthcare due to economic hardship related to COVID-19, receiving gender-affirming healthcare due to limited access to hospitals under the COVID-19 situation, and purchasing a public face mask because they were required to present their identification card which includes gender information. In addition, 4.6% of the participants avoided getting tested in fear of unfair treatment and dirty looks because of their gender identity, even though they had suspected symptoms. Based on these responses, 30.7% had any transgender-specific COVID-19-related stressor, and 12.9% reported two or more stressors. Stratified by transgender identity, 43.7% of trans women, 41.4% of trans men, 13.1% of nonbinary AFAB, and 34.9% of nonbinary AMAB participants reported any transgender-specific COVID-19-related stressor, respectively.

Of the 564 participants, the majority identified as non-heterosexual, were in their late teens or twenties, and lived in a metropolitan area (Table 2). More than half graduated from high school or less and had no individual income. Regarding

Table 1. Prevalence of transgender-specific COVID-19-related stressors by transgender identity among 564 Korean transgender adults.

	Full sample	Trans woman	Trans man	Nonbinary AFAB	Nonbinary AMAB
	N (%)	N (%)	N (%)	N (%)	N (%)
	564 (100.0)	183 (32.5)	104 (18.4)	214 (37.9)	63 (11.2)
Each transgender-specific COVID-19-related stressor					
(A) Had difficulty receiving gender-affirming healthcare due to economic hardship related to COVID-19	87 (15.4)	44 (24.0)	20 (19.2)	12 (5.6)	11 (17.5)
(B) Had difficulty receiving gender-affirming healthcare due to limited access to hospitals under the COVID-19 situation	86 (15.3)	43 (23.5)	23 (22.1)	8 (3.7)	12 (19.1)
(C) Had difficulty purchasing a public face mask due to gender information on an identification card	83 (14.7)	34 (18.6)	27 (26.0)	13 (6.1)	9 (14.3)
(D) Avoided getting a COVID-19 test in fear of unfair treatment and dirty looks due to gender identity, despite having COVID-19 symptoms	26 (4.6)	12 (6.6)	4 (3.9)	7 (3.3)	3 (4.8)
Any transgender-specific COVID-19-related stressor					
Never experienced	391 (69.3)	103 (56.3)	61 (58.7)	186 (86.9)	41 (65.1)
Experienced	173 (30.7)	80 (43.7)	43 (41.4)	28 (13.1)	22 (34.9)
Number of transgender-specific COVID-19-related stressors					
None	391 (69.3)	103 (56.3)	61 (58.7)	186 (86.9)	41 (65.1)
One	100 (17.7)	45 (24.6)	23 (22.1)	19 (8.9)	13 (20.6)
Two or more	73 (12.9)	35 (19.1)	20 (19.2)	9 (4.2)	9 (14.3)

Note. AFAB = assigned female at birth; AMAB = assigned male at birth.

any transgender-specific COVID-19-related stressor, the prevalence was higher among those who identified as heterosexual, were nonpermanent workers or unemployed, and tried to change legal gender but did not change it, compared to their respective counterparts.

Table 2. Distribution of study population and prevalence of any transgender-specific COVID-19-related stressor and depressive symptoms among 564 Korean transgender adults.

	Full sample	Any transgender-specific COVID-19-related stressor		Past-week depressive symptoms	
	N (%)	N (%)		N (%)	
	564 (100.0)	173 (30.7)	P-value	396 (70.2)	P-value
Transgender identity			<0.001		0.007
Trans woman	183 (32.5)	80 (43.7)		135 (73.8)	
Trans man	104 (18.4)	43 (41.4)		59 (56.7)	
Nonbinary AFAB	214 (37.9)	28 (13.1)		153 (71.5)	
Nonbinary AMAB	63 (11.2)	22 (34.9)		49 (77.8)	
Sexual orientation			0.011		0.021
Heterosexual	102 (18.1)	43 (42.2)		58 (56.9)	
Lesbian/gay	62 (11.0)	23 (37.1)		47 (75.8)	
Bisexual	235 (41.7)	70 (29.8)		170 (72.3)	
Asexual	131 (23.2)	30 (22.9)		98 (74.8)	
Others	34 (6.0)	7 (20.6)		23 (67.7)	
Age (years)			0.773		<0.001
19–24	314 (55.7)	90 (28.7)		245 (78.0)	
25–29	142 (25.2)	46 (32.4)		91 (64.1)	
30–34	61 (10.8)	22 (36.1)		34 (55.7)	
35–39	33 (5.9)	10 (30.3)		19 (57.6)	
40–60	14 (2.5)	5 (35.7)		7 (50.0)	
Residential area			0.124		0.105
Metropolitan area	403 (71.5)	116 (28.8)		275 (68.2)	
Non-metropolitan area	161 (28.6)	57 (35.4)		121 (75.2)	
Educational attainment			0.363		0.018
High school graduate or less	347 (61.5)	114 (32.9)		254 (73.2)	
2-year college graduate	42 (7.5)	10 (23.8)		34 (81.0)	
4-year college graduate	154 (27.3)	45 (29.2)		96 (62.3)	
Graduate school graduate or more	21 (3.7)	4 (19.1)		12 (57.1)	
Monthly individual income (unit: 1,000 Korean Won)			0.159		<0.001
None	313 (55.5)	94 (30.0)		235 (75.1)	
<1,000	74 (13.1)	24 (32.4)		58 (78.4)	
1,000–1,999	92 (16.3)	36 (39.1)		67 (72.8)	
2,000–2,999	56 (9.9)	11 (19.6)		25 (44.6)	
≥3,000	29 (5.1)	8 (27.6)		11 (37.9)	
Employment status			0.001		0.001
Student	222 (39.4)	50 (22.5)		170 (76.6)	
Permanent employee	101 (17.9)	26 (25.7)		55 (54.5)	
Nonpermanent employee	48 (8.5)	21 (43.8)		36 (75.0)	
Self-employed	60 (10.6)	22 (36.7)		37 (61.7)	
The unemployed	133 (23.6)	54 (40.6)		98 (73.7)	
Recruitment channel			0.500		0.368
Facebook page or online transgender communities	146 (25.9)	48 (32.9)		106 (72.6)	
Primary healthcare clinics	68 (12.1)	25 (36.8)		41 (60.3)	
LGBT rights organizations	92 (16.3)	27 (29.4)		66 (71.7)	
Acquaintance or friends	197 (34.9)	59 (30.0)		142 (72.1)	
Other channels	61 (10.8)	14 (23.0)		41 (67.2)	
Legal gender status			<0.001		0.003
Never tried to change legal gender	481 (85.3)	135 (28.1)		345 (71.7)	
Changed legal gender	47 (8.3)	13 (27.7)		23 (48.9)	
Tried to change legal gender but did not change it	36 (6.4)	25 (69.4)		28 (77.8)	
Gender perception by others			0.082		<0.001
Perceived as my gender identity	161 (28.6)	58 (36.0)		93 (57.8)	
Not perceived as my gender identity	403 (71.5)	115 (28.5)		303 (75.2)	

Note. AFAB = assigned female at birth; AMAB = assigned male at birth; LGBT = lesbian, gay, bisexual, and transgender.

[a]P-value of the Chi-square test comparing the prevalence of any transgender-specific COVID-19-related stressor and depressive symptoms by covariates.

The overall prevalence of past-week depressive symptoms was 70.2%, as shown in Table 2. Regarding transgender identity, those who were classified as having depressive symptoms were 73.8% in trans women, 56.7% in trans men, 71.5% in nonbinary AFAB, and 77.8% in nonbinary AMAB, respectively. Transgender participants who were identified as non-heterosexual, aged 19–24 years old, had low educational attainment or a low-income level, and were students, non-permanent workers, or unemployed were more likely to report depressive symptoms than their counterparts, respectively. Also, those whose legal gender remained unchanged and those who were not perceived as their gender identity by others showed higher prevalence of depressive symptoms, compared to their respective counterparts.

Table 3 shows that two of the four transgender-specific COVID-19-related stressors with regard to gender-affirming healthcare was associated with depressive symptoms. Statistically significant associations with depressive symptoms were observed among those who reported difficulty receiving gender-affirming healthcare under the COVID-19 situation due to economic hardship (adjusted prevalence ratio [aPR] = 1.20, 95% CI = 1.05–1.37) or due to limited access to hospitals (aPR = 1.15, 95% CI = 1.00–1.32). The association was marginally significant among those who reported difficulty in purchasing a public face mask because they were required to present an identification card including gender information (aPR = 1.15, 95% CI = 1.00–1.32).

As presented in Table 4, the prevalence of depressive symptoms was 1.12 times (95% CI = 1.00–1.25) higher among those who had any transgender-specific COVID-19-related stressor, compared to those who had no such stressor. Furthermore, based on the number of transgender-specific COVID-19-related stressors, those who reported two or more stressors were 1.21 times (95% CI = 1.05–1.40) more likely to report depressive symptoms than those who did not report any stressor. However, the association was not significant among those who experienced one stressor.

Discussion

To our knowledge, this is the first empirical research of transgender individuals' COVID-19-related experiences in Korea. Our findings suggest that a substantial portion of the participants had any transgender-specific COVID-19-related

Table 3. Associations between each transgender-specific COVID-19-related stressor and depressive symptoms among 564 Korean transgender adults.

Each transgender-specific COVID-19-related stressor	Distribution	Depressive symptoms Prevalence	Unadjusted		Adjusted[a]	
	N (%)	N (%)	PR	95% CI	PR	95% CI
(A) Had difficulty receiving gender-affirming healthcare due to economic hardship						
Never experienced	391 (69.3)	262 (67.0)	1	Reference	1	Reference
Experienced A	87 (15.4)	73 (83.9)	1.25***	1.12–1.41	1.20**	1.05–1.37
Experienced stressor(s) other than A (i.e., B, C, and/or D)	86 (15.3)	61 (70.9)	1.06	0.91–1.23	1.04	0.91–1.20
(B) Had difficulty receiving gender-affirming healthcare due to limited access to hospitals						
Never experienced	391 (69.3)	262 (67.0)	1	Reference	1	Reference
Experienced B	86 (15.3)	69 (80.2)	1.20**	1.06–1.36	1.15*	1.00–1.32
Experienced stressor(s) other than B (i.e., A, C, and/or D)	87 (15.4)	65 (74.7)	1.11	0.97–1.28	1.09	0.96–1.24
(C) Had difficulty purchasing a public face mask due to gender information on an identification card						
Never experienced	391 (69.3)	262 (67.0)	1	Reference	1	Reference
Experienced C	83 (14.7)	65 (78.3)	1.17*	1.02–1.33	1.15	1.00–1.32
Experienced stressor(s) other than C (i.e., A, B, and/or D)	90 (16.0)	69 (76.7)	1.14*	1.00–1.31	1.09	0.96–1.25
(D) Avoided getting a COVID-19 test in fear of unfair treatment and dirty looks due to gender identity, despite having COVID-19 symptoms						
Never experienced	391 (69.3)	262 (67.0)	1	Reference	1	Reference
Experienced D	26 (4.6)	21 (80.8)	1.21	0.99–1.47	1.15	0.95–1.40
Experienced stressor(s) other than D (i.e., A, B, and/or C)	147 (26.1)	113 (76.9)	1.15*	1.02–1.28	1.11	0.99–1.25

*p < 0.05; **P < 0.01; ***P < 0.001.

[a]Adjusted for transgender identity, sexual orientation, age, residential area, educational attainment, monthly individual income, employment status, data collection channels, legal gender status, and gender perception by others.

Table 4. Associations between any or the number of transgender-specific COVID-19-related stressors and depressive symptoms among 564 Korean transgender adults.

	Distribution	Depressive symptoms Prevalence	Unadjusted		Adjusted[a]	
	N (%)	N (%)	PR	95% CI	PR	95% CI
Any transgender-specific COVID-19-related stressor						
Never experienced	391 (69.3)	262 (67.0)	1	Reference	1	Reference
Experienced	173 (30.7)	134 (77.5)	1.16**	1.04–1.29	1.12*	1.00–1.25
Number of transgender-specific COVID-19-related stressors						
None	391 (69.3)	262 (67.0)	1	Reference	1	Reference
One	100 (17.7)	72 (72.0)	1.07	0.93–1.24	1.06	0.93–1.20
Two or more	73 (12.9)	62 (84.9)	1.27***	1.13–1.43	1.21*	1.05–1.40

*p < 0.05; **P < 0.01; ***P < 0.001.
[a]Adjusted for transgender identity, sexual orientation, age, residential area, educational attainment, monthly individual income, employment status, data collection channels, legal gender status, and gender perception by others.

stressor during the pandemic period. Particularly, trans women, trans men, and nonbinary AMAB participants were more likely to have any transgender-specific COVID-19-related stressor, compared to nonbinary AFAB participants. Those who were nonpermanent workers and unemployed were also more likely than other employment subgroups to report any transgender-specific COVID-19-related stressor. In addition, those who tried but failed to change their legal gender marker showed higher prevalence of any transgender-specific COVID-19-related stressor, compared to others who received legal gender affirmation or never tried to change legal gender. Given these findings, the COVID-19 pandemic may take a heavier toll on transgender individuals with these characteristics.

Our results corroborate with recently published reports in other parts of the world that demonstrate transgender individuals' experiences of transgender-specific COVID-19-related stressors (Jarrett et al., 2021; Jones et al., 2021; Kidd et al., 2021; Koehler et al., 2020). Among 161 transgender and gender diverse participants who participated in a study conducted in the U.K., 51.5% agreed that they had difficulty accessing gender-affirming healthcare services due to the COVID-19 pandemic (Jones et al., 2021). In a global study, 55.0% of 582 participants experienced reduced access to gender-affirming healthcare and resources during the COVID-19 pandemic (Jarrett et al., 2021). In the same study, 38.0% of 860 participants reported that they were less or not able to live according to their gender identity under the pandemic (Jarrett et al., 2021). Although a lack of standardized questionnaires and different sociocultural backgrounds partially obscure direct comparisons, findings from these previous studies and our current study may serve as a groundwork for future research on gender-related health and access to services during the COVID-19 pandemic.

In the current study, we found that transgender participants who experienced any transgender-specific COVID-19-related stressor were more likely to report depressive symptoms, compared to those who did not experience such stressor. Our findings also showed a dose-response relationship between the number of stressors experienced and prevalence estimates of depressive symptoms. Specifically, participants who had two or more of the four transgender-specific COVID-19-related stressors showed significantly higher prevalence of depressive symptoms than those with no such stressor. Given this relationship, future research is needed to investigate the processes by which syndemic relationships or co-occurrences of transgender-specific COVID-19-related stressors may interact to exacerbate the mental health of this population.

Our findings are in line with previous studies (Gato et al., 2021; Gonzales et al., 2020; Suen et al., 2020) that support minority stress theory (Meyer, 2003; Testa et al., 2015). These previous studies showed that LGBT populations, in general, experience unique stressors due to their sexual orientation and/or gender identity in the context of the COVID-19 pandemic, which in turn, negatively influence their health (Gato et al., 2021; Gonzales et al., 2020; Suen et al., 2020). Moreover, our findings were consistent, in

part, with prior studies exploring the mental health impact of transgender-specific COVID-19-related stressors in the transgender population in particular (Jarrett et al., 2021; Jones et al., 2021; Kidd et al., 2021; Zwickl et al., 2021). For instance, in a US-based longitudinal study of transgender people (N = 208), participants who reported reduced support from LGBT-specific or transgender-specific community had significantly greater psychological distress, even after controlling for pre-pandemic psychological distress (Kidd et al., 2021). However, in the same study, a significant association with psychological distress was not observed among those who reported that their gender-affirming healthcare was interrupted or delayed during the pandemic, after adjusting for pre-pandemic psychological distress (Kidd et al., 2021). Further research is therefore needed to assess various types of transgender-specific COVID-19-related stressors and their mental health impact using a longitudinal study of a large sample of transgender people with diverse backgrounds in Korea.

When interpreting our findings, it is important to take into account the social backgrounds of transgender populations living in Korea where the current study was conducted. First, transgender individuals have faced multiple barriers to accessing gender-affirming healthcare in Korea (Lee et al., 2018). Barriers include financial burdens of gender-affirming healthcare service, unfair treatments or discrimination that they previously experienced in healthcare settings, and a lack of healthcare providers who can provide specialized and culturally competent care for transgender individuals (Lee et al., 2018). In addition, due to travel restrictions under the COVID-19 pandemic, Korean transgender individuals may be compelled to delay or cancel planned gender-affirming surgery in Thailand, where many transgender individuals have undergone surgeries (Kim et al., 2018). It has been also reported that, when transgender individuals visit healthcare institutions for health issues unrelated to gender-affirming healthcare in Korea (e.g., primary care), they experience unfair treatments or discrimination, including offensive comments or unnecessary inquiries about their gender identity (Kim et al., 2018). As such, while our findings show barriers to access to gender-affirming healthcare continue to impact transgender people's mental health, the degree to which access to general healthcare may have been impacted by the COVID-19 pandemic remains unexamined among transgender communities in Korea, a point for future research.

Second, for transgender individuals who had not yet amended or were not able to change legal gender marker to reflect their current gender identity and expression, they may be at-risk of experiencing mistreatment and harassment from sellers and be denied purchase of government-approved KF masks at pharmacies. Moreover, given the strict medical requirements for changing gender marker in identification documents in Korea (e.g., individuals should provide proof of gender-affirming surgery) (Hong & Lee, 2013), changing gender marker at the time of COVID-19 could be challenging due to delays in gender-affirming services, making purchasing face masks even more difficult. Consequently, transgender individuals may unnecessarily encounter potential risks of COVID-19 acquisition because of these legal and medical barriers to supplies.

Furthermore, in early May 2020, it was reported that more than 200 confirmed COVID-19 cases were related to visiting nightclubs in the Itaewon area in Seoul, one of which catered to the LGBT community. Following this report, Korean media stigmatized the LGBT community and its members for spreading COVID-19 by unduly focusing on the LGBT venue over other venues (C. R. Kang et al., 2020; Thoreson, 2020). Transgender people may be more vulnerable to such stigmatization by Korean media, given recent transgender rights issues in Korean society, including a trans woman soldier who was forcibly discharged by the Army after her gender-affirming surgery in January 2020 (Choe, 2021). Soon after the outbreak in the Itaewon area, an LGBT COVID-19 Crisis Task Force was established by civil society organizations to denounce homophobic and transphobic media reports. Anonymous COVID-19 testing, recommended by the Task Force, has also since been provided by the Seoul Metropolitan Government (C. R. Kang et al., 2020; LGBT COVID-19 Crisis Task Force, 2020). These incidents and the following actions may have had a direct and indirect

impact on how transgender individuals navigate healthcare systems, including obtaining needed COVID-19 tests. While our results show that there was no significant relationship between avoiding the COVID-19 test in fear of unfair treatment and dirty looks due to gender identity and increased depressive symptoms, there is a need to address avoidance of testing due to fear of gender-based stigma and discrimination.

In this ongoing pandemic, our results provide a number of future research directions aimed at exploring other stressors that transgender people may have experienced, in addition to the stressors addressed in the current study, and investigating whether these stressors negatively impact transgender people's health in Korea. First, it is important to assess whether transgender people are isolated or disconnected from their social networks (e.g., LGBT community) which can serve as a buffer to external stressors. Second, as the time spent at home increases, transgender people may be more frequently exposed to conflicts and instances of violence from their family or intimate partner who do not support their gender identity. Furthermore, access to mental health services may also be restrained, despite urgent needs for them during the COVID-19 pandemic.

Limitations & strengths

This study should be interpreted with caution due to several limitations. First, considering its cross-sectional survey design, it is difficult to prove a causal effect of transgender-specific COVID-19-related stressors on depressive symptoms among Korean transgender adults. Second, the generalizability of our findings cannot be achieved due to non-probability sampling. Third, the way current gender identity was assessed in this study did not allow for self-description, and the construction of our gender identity variable included four categories (i.e., trans woman, trans man, nonbinary AFAB, and nonbinary AMAB) which might mask the full range of gender identities within the transgender spectrum. Fourth, given that the measures for assessing transgender-specific COVID-19-related stressors were created for this study, there is a need for them to be validated in future research. Fifth, we did not stratify the associations between transgender-specific COVID-19-related stressors and depressive symptoms by transgender identities due to the small sample size of subgroups, which calls for further research. Lastly, residual confounders may not be fully excluded in the analysis.

As the first-known study exploring Korean transgender individuals' experiences during the COVID-19 pandemic, our findings contribute to the understanding of transgender-specific COVID-19-related stressors and their mental health impact. Using the largest sample of Korean transgender populations, we found that a sizable portion of Korean transgender adults has had transgender-specific COVID-19-related stressors that are linked to their depressive symptoms.

Conclusions

Given our findings, transgender-inclusive social and health policy interventions should be implemented in Korea to prevent transgender individuals from having COVID-19-related stressors due to their gender identity and further mitigate the harmful mental health impact of these stressors. In addition, data collection on sexual orientation and gender identity in public health surveillance systems may facilitate a better understanding of COVID-19-related socioeconomic vulnerabilities and health disparities of LGBT individuals in Korea, which can also enable to develop appropriate interventions for them (Cahill et al., 2020). Furthermore, anti-discrimination laws should be institutionalized in Korea, so that transgender individuals could access necessary testing, treatment, and care without any concern of being discriminated against or rejected in this prolonged period of COVID-19.

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Disclosure statement

The authors have no known conflicts of interest to disclose.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the institutional review board of Korea University (KUIRB-2020-0189-01).

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